From Cluster Bombs to Underground Reactors: Parsons, Kansas as a Test Case in Absent Consent

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Parsons, Kansas is not just another rural town chasing jobs. It sits in the shadow of the former Kansas Army Ammunition Plant, a site that once produced artillery and cluster munitions and is now rebadged as the Great Plains Industrial Park. Onto this already loaded landscape, a new experiment is being placed: Deep Fission's mile-deep "Gravity" nuclear reactor, fast-tracked under a federal pilot program and marketed as a safe, invisible, and dramatically cheaper source of power. At first glance the story reads like a familiar narrative of innovation and economic development. Yet viewed from thirty miles away, it also looks like the repetition of a pattern: high-consequence technologies sited in quiet places with limited voice, wrapped in optimistic rhetoric about abundance and independence. This paper uses Parsons as a lens on that pattern. It connects the munitions legacy of the site, the redevelopment into an industrial park, and the emerging drive to power data centers and AI infrastructure through advanced nuclear. The goal is not to condemn nuclear power in the abstract, but to ask what consent, stewardship, and moral memory would look like if they were taken seriously. Parsons becomes a test case for how we load places with risk while insisting it is all for their own good.

Keywords: Parsons Kansas, Great Plains Industrial Park, Kansas Army Ammunition Plant, cluster munitions, Deep Fission, Gravity Nuclear Reactor, advanced nuclear, small modular reactor, borehole reactor, data centers, artificial intelligence, energy infrastructure, rural communities, environmental justice, technological risk, moral responsibility, absent consent, United States Department of Energy.

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1. Introduction: A Reactor in the Shadow of Cluster Bombs

Parsons, Kansas is easy to miss on a national map. It is not a coastal tech hub, not a capital city, not a metro area with millions of ratepayers and layers of organized civil society. It is a small town in southeast Kansas, surrounded by farmland and scattered churches, lying within the gravitational field of a very particular landscape: the former Kansas Army Ammunition Plant. For decades, that plant produced artillery shells and cluster munitions for American wars. Now the same land, rebranded as the Great Plains Industrial Park, has been chosen as the site for one of the most aggressively timed, first-of-its-kind nuclear projects in the United States: a mile-deep "Gravity" reactor, designed and built by Deep Fission under a federal pilot program to accelerate advanced nuclear deployment.

The official story is clean and enticing. The project is framed as an investment in innovation, energy independence, and economic development. The reactor will be buried one mile underground, using the Earth itself for shielding and containment. The surface footprint will be tiny. The technology is presented as safer and more affordable than the large nuclear plants of the past, and as a key contributor to meeting growing electricity demands, including those driven by data centers and artificial intelligence.

From a distance, the narrative is legible: a rural community gains jobs and tax base; the state positions itself at the forefront of advanced energy; the federal government tests new reactor designs that promise low-carbon power. Yet, viewed from closer by, another story comes into focus. The very same ground that once manufactured cluster bombs is being asked to host a first-in-world configuration of nuclear technology, fast-tracked on a compressed schedule, with largely symbolic talk of "community engagement" and "transparency." The past moral weight of the place, the long tail of contamination, and the asymmetry between those who benefit and those who bear the irreversible risk are barely acknowledged.

This paper takes Parsons as more than a local zoning decision. It treats the town and its surrounding land as a test case in how high-consequence technologies are layered onto particular places, and how consent can be formally invoked yet substantively absent. The reactor in the shadow of cluster bombs becomes a concrete instance of a broader pattern: when innovation and national ambition seek a home, they often choose quiet communities with limited power to decline.

In what follows, Parsons is not used as a symbol only. It is examined in its specificity: as a former munitions complex, as a rebranded industrial park, as a proposed energy-compute hub, and as a living community of people whose lives will be intertwined with whatever is buried a mile beneath their soil.

1.1 Framing Parsons as more than a local siting decision

On paper, the Deep Fission project is a sequence of administrative steps: a company selects a site, signs agreements with a development authority, enters a Department of Energy pilot program, and proceeds through regulatory and environmental review. The public record is filled with familiar phrases: partnership, opportunity, innovation, workforce development. Within that frame, Parsons is simply a convenient and appropriate host, one of many possible locations in a national portfolio.

This framing is incomplete. Parsons is also a place with a specific history of serving as an instrument of national policy, especially in times of war. The decision to locate the Kansas Army Ammunition Plant there was not just an economic development choice; it positioned the land and its people as part of the machinery of conflict. That choice left physical residues in soil and water, and psychic residues in memory and identity.

Treating the selection of Parsons for an underground reactor as a purely technical or economic matter erases this history. It suggests that each project starts on a blank slate, and that prior uses of land do not shape what is just or unjust to ask of a community now. A more honest framing acknowledges that the former ammunition plant and the proposed reactor are not separate stories, but chapters in a single narrative about how certain places become repositories for risk on behalf of the nation.

To say that Parsons is more than a local siting decision is also to recognize that the project is being watched from far beyond Labette County. Advanced nuclear developers, data center operators, and policymakers interested in rapid energy expansion all have stakes in whether the Deep Fission model is perceived as successful. If the Parsons pilot is hailed as a triumph of safe, fast, underground nuclear, it will help normalize a template for future siting decisions elsewhere. What happens beneath Kansas farmland will not stay in Kansas.

1.2 The argument in brief: technology, place, and absent consent

The core argument of this paper is simple but layered. First, advanced technologies do not land on generic terrain. They accumulate in specific places that already bear the marks of previous decisions. The Kansas Army Ammunition Plant and the Great Plains Industrial Park are not interchangeable with any other industrial site; their past uses matter for how one should ethically evaluate future uses.

Second, the rhetoric that accompanies such projects often obscures this layered reality. Talk of energy independence, abundance, and innovation acts as a solvent, dissolving messy histories into a clean narrative of progress. Phrases like “passive geological shielding” and “minimal surface footprint” highlight supposed technical virtues while backgrounding questions about

inspection, long-term stewardship, and what happens if something goes wrong a mile underground.

Third, the concept of consent, though frequently invoked, is thin. Public meetings, opportunities for comment, and letters of support from state and local officials create the appearance of broad community participation. Yet the asymmetry of information, expertise, and power between residents and the coalition of company, state, and federal actors means that many local stakeholders may not fully grasp the implications of what is being proposed, nor feel truly free to oppose it. Consent in such a context risks becoming ceremonial rather than substantive.

The paper therefore treats Parsons as a case study in absent consent: a situation where formal procedures for engagement exist, but the deeper moral prerequisites for shared decision-making are not met. By tracing the trajectory from munitions plant to industrial park to underground reactor, it seeks to make visible the structure of this absence and to ask what a more honest, robust notion of consent would look like.

1.3 Scope and limitations of this case study

This paper is not a comprehensive technical assessment of the Deep Fission Gravity reactor design, nor a full legal analysis of the Department of Energy's pilot program. It is written from the standpoint of public, published information about the project, the documented history of the Kansas Army Ammunition Plant, and the broader literature on nuclear siting, environmental justice, and technological risk. It is also informed by the perspective of an observer who lives within driving distance of Parsons and is familiar with the cultural and geographic setting of southeast Kansas.

Several limitations follow from this scope. First, many key technical details of the reactor design, operational protocols, and safety analysis are proprietary or still in development, and therefore not available for independent scrutiny. The analysis here focuses on what can be inferred from publicly available descriptions and from analogies to other nuclear and subsurface engineering practices.

Second, the local perspective, while grounded in real proximity and memory, is not presented as a statistically representative survey of community attitudes. Parsons and Labette County encompass a range of views, including enthusiastic support, cautious optimism, indifference, and opposition. This paper does not claim to speak for all residents, but rather to articulate a particular ethical concern rooted in the history of the site and in the pattern of decision-making.

Third, the paper does not attempt to adjudicate between all possible energy futures for Kansas or the United States. It does not argue against nuclear power in principle, nor does it propose a full alternative portfolio of solar, wind, storage, or demand reduction. The aim is narrower: to illuminate how one specific advanced nuclear project interacts with place, memory, and

consent, and to derive from that interaction questions that should be asked more broadly as similar projects are proposed elsewhere.

Finally, this is a case study, not a verdict. Parsons is taken as a revealing example, not as a unique pathology. The hope is that by looking closely at this town in the shadow of cluster bombs and a mile-deep reactor, patterns become clearer that are already at work across many other communities. Those patterns concern who carries risk, who writes the story, and what it would mean to treat both technology and place with genuine respect.

2. A Place Built for War: The Kansas Army Ammunition Plant

Long before anyone proposed burying a nuclear reactor a mile under Kansas farmland, the land east of Parsons had already been drafted into a different kind of national service. In 1942, at the height of World War II mobilization, the United States Army carved more than thirteen thousand acres out of rural Labette County to create what became the Kansas Army Ammunition Plant. It was a classic example of the government-owned, contractor-operated model: the Army owned the land and infrastructure; companies such as Day and Zimmermann were contracted to run the production lines. The plant's mission was blunt and unambiguous. It existed to load, assemble, and pack the munitions needed to fight America's wars.

Over the next six decades the plant became a constant, if sometimes invisible, presence in the life of southeast Kansas. It produced artillery shells, mortar rounds, and increasingly sophisticated air-dropped weapons. It ramped up and down with global conflict cycles, surging for World War II, Korea, Vietnam, and Desert Storm. It employed thousands over the decades and at its mid-1980s peak provided work for roughly 1,800 people, drawing from Parsons and small towns across the region. The Kansas Army Ammunition Plant was never just a factory; it was an engine that tied the livelihoods of local families to events unfolding on distant battlefields.

Seen from this angle, the Great Plains Industrial Park is not a neutral "redevelopment opportunity." It is the afterlife of a site whose physical layout, buried infrastructure, and groundwater history were all shaped by the imperatives of war. The proposal to add an underground reactor to that landscape does not overwrite the past; it layers a new experiment onto an already loaded terrain.

2.1 Origins of the plant and its role in U.S. conflicts

The Kansas Army Ammunition Plant was born of urgency. In 1942, as the United States expanded its industrial base to meet wartime demand, the Army sited a series of large ammunition plants inland, away from coastal attack, but with good access to rail and labor. The

Parsons area offered rail lines, relative isolation, and land that could be acquired and fenced. Farms and homesteads were displaced, and the new installation transformed the local geography into a militarized grid of production lines, storage bunkers, test ranges, and restricted zones.

From the beginning, the plant's mission was explicitly tied to the production of conventional munitions. Official Army documents describe the facility as responsible for loading, assembling, and packing mortar rounds, howitzer projectiles, improved conventional munitions, and cluster bomb units, along with associated primers, detonators, and fuze components. The plant came fully online during World War II, contributing to the vast volume of shells and bombs that sustained Allied operations in Europe and the Pacific.

After the war, demand fell, but the plant did not simply shut down. It cycled into a maintenance mode and then back into higher production during the Korean War and later Vietnam. Each conflict brought new contracts, new shifts, and sometimes new weapons systems. By the later Cold War, Kansas AAP was part of a distributed industrial base that allowed the United States to rapidly expand munitions production if needed.

The plant's integration into the national ammunition base continued into the 1990s. During the Gulf War era it supported operations through its production lines and stockpile maintenance roles. The official Army history of Desert Shield/Desert Storm notes Kansas among the plants in the ammunition industrial base, even as the long post–Cold War drawdown loomed.

By the early 2000s, the logic of base realignment and closure caught up with Kansas AAP. The 2005 BRAC Commission recommended closing the plant and transferring its remaining munitions functions—including cluster bomb and sensor-fuzed weapon production—to other facilities, notably McAlester Army Ammunition Plant in Oklahoma. The final deflagging ceremony in March 2009 marked the end of 68 years of active ammunition production on the site.

What did not end in 2009 was the imprint of that mission on the land and the community. The plant had shaped employment patterns, migration, and local identity for generations. It had also left behind, in soil, groundwater, and structures, the chemical traces of the work it had done.

2.2 Cluster munitions and the moral weight of past production

In its later decades, Kansas AAP became associated not only with standard artillery and mortars but with controversial cluster munitions and sensor-fuzed weapons. Publicly available Army and BRAC documents note the plant's role in producing components and final assemblies for the Air Force's Sensor Fuzed Weapon and for BLU-97 bomblets, which are combined into larger cluster bomb units.

Cluster munitions are designed to disperse many small submunitions over a wide area. Militarily, this offers coverage against dispersed targets. Humanitarian critics, however, have long emphasized the dark mirror of this design: a significant fraction of submunitions fail to detonate on impact and remain as unexploded ordnance, effectively functioning as land mines. Children and civilians encounter them years or decades after conflicts end. The global debate over cluster munitions led to the Convention on Cluster Munitions in 2008, which bans their use, production, and transfer for states that ratify it. The United States has not joined that convention, but the existence of the treaty codifies the moral unease that has grown around these weapons.

For a facility like Kansas AAP, the ethical questions are acute. Workers in Parsons were building weapons that have been criticized for causing civilian harm long after hostilities cease. At the same time, those workers were trying to support families, often without full visibility into where or how their products would be used. The plant sat at the intersection of national policy, military doctrine, and local economic necessity.

The moral weight of this production is not abstract. On July 26, 1989, a BLU-97 cluster bomb subassembly being manufactured in Building 1113 exploded, killing two employees and injuring several others. In a grim inversion of the usual pattern, these particular cluster munitions killed civilians before they ever left U.S. soil. Investigations pointed to a damaged fuze component as a likely trigger. The blast became part of the plant's lore, a reminder that the risks of such weapons begin at the factory, not only on the battlefield.

Later reporting has noted how this accident, and the humanitarian controversy over cluster munitions more broadly, cast a long shadow over the Kansas facility's legacy. The site appears not only in Army histories but also in human rights timelines and, more folklorically, in local ghost stories that speak of workers haunted by explosion victims when the plant was reactivated during the Gulf War era.

For the purposes of this paper, the key point is not to render a final moral judgment on every weapon the plant produced. It is to recognize that the land now being promoted as a proving ground for "next-generation nuclear" has already served as a proving ground for weapons that many now regard as ethically compromised. That history does not disappear when ownership changes or when the mission is rebranded from bombs to "energy abundance."

2.3 Accidents, contamination, and the long half-life of decisions

Ammunition plants are hazardous places even when nothing explodes. They handle high explosives, propellants, heavy metals, energetic solvents, and a variety of specialty chemicals. Over decades, leaks, spills, open burning, and disposal practices contribute to contamination that sinks into soil and groundwater. Kansas AAP was no exception. Environmental assessments

by the Environmental Protection Agency and the Army document multiple areas of concern, including explosive residues, metals, and later, per- and polyfluoroalkyl substances (PFAS) from firefighting foams and related activities.

The plant was not listed on the National Priorities List as a Superfund site; instead, cleanup and monitoring proceeded under the Resource Conservation and Recovery Act. In 2003 and 2005, EPA issued determinations that contamination was “under control” with respect to human exposure and groundwater migration, meaning that known releases were being managed through corrective actions and institutional controls. That did not mean the site was restored to a pristine state, only that regulators judged the remaining risks to be contained by the measures in place.

As the BRAC process moved toward closure and redevelopment, cleanup became entangled with economic bargaining. A 2000 report in an environmental policy outlet described a deal under which a private developer would take over significant portions of the plant and assume responsibility for certain cleanup costs. Supporters hailed this as a creative way to fund remediation without large additional federal expenditure. Critics argued that the local community had been “backed into a corner,” having to accept redevelopment on terms that locked in residual contamination and limited future land uses.

More recently, the Army has conducted site inspections specifically targeting PFAS at the former Kansas AAP, reflecting growing concern about the persistence and health effects of these chemicals. Reports from 2023–2024 document ongoing sampling and evaluation of groundwater and other media for PFAS contamination at selected areas of interest on the site. These efforts underscore that, even decades after the first shells were loaded, the environmental story of the plant is not finished.

The 1989 BLU-97 explosion is the most widely reported accident, but it was not the only dangerous incident or near-miss. Across the Army’s ammunition industrial base, including Kansas, open-burning grounds, disposal pits, and aging infrastructure created chronic risks. Even in the absence of spectacular accidents, workers lived with the possibility of mishaps every day.

The “half-life” of decisions made in the 1940s through 1980s thus has at least three dimensions. There is the literal half-life of explosive residues and other contaminants that persist in soil and water. There is the institutional half-life of contracts, cleanup agreements, and land-use covenants that shape what can or cannot be done on the site today. And there is the moral and psychological half-life: the memories of explosions, the knowledge of what was built here, and the uneasy sense that the land’s past has not yet been fully accounted for.

When the Great Plains Industrial Park now advertises the site as a “Kansas Proving Grounds” for energy and data-center development, it builds directly atop this layered history. The proposal to

drill a mile-deep borehole and operate a nuclear reactor at the bottom does not emerge in empty space. It is another long-half-life decision made on land that has already absorbed many such decisions. Any serious evaluation of the new project has to take that continuity seriously, rather than treating the underground reactor as a novel beginning with no past.

3. Rebranding Risk: From Ammunition Plant to Industrial Park

When the Kansas Army Ammunition Plant was finally closed under the 2005 Base Realignment and Closure process, it did not simply vanish. The fences, bunkers, production lines, and contaminated soils could not be wished away. Instead, the site had to be translated from a military asset into something else that could fit within civilian economic and regulatory frameworks. That "something else" became the Great Plains Industrial Park, a name that presents the land as an open canvas for logistics, manufacturing, energy, and now, potentially, data centers and underground nuclear reactors.

Rebranding the plant as an industrial park was not a neutral relabeling. It was an attempt to take a landscape structured for war and recode it as a landscape of opportunity. This transition required not only physical cleanup and legal transfer but also narrative work. The story of the place had to be retold in a way that emphasized jobs, infrastructure, and strategic location, while backgrounding or compressing its long association with cluster munitions, accidents, and environmental risk. The Great Plains Industrial Park is therefore as much a discursive project as it is a physical one.

3.1 Base closure, cleanup, and the Great Plains Industrial Park

The closure of the Kansas Army Ammunition Plant was part of a broader effort to rationalize the U.S. defense footprint after the Cold War. Once the BRAC Commission recommended shutting the plant and consolidating its functions elsewhere, the Army began the process of planning disposition, remediation, and eventual transfer. This involved multiple overlapping regimes: federal property law, environmental cleanup obligations, and economic adjustment assistance for the surrounding community.

On the environmental side, the site moved through formal corrective action processes that aimed to identify contaminated areas, implement remediation or containment, and establish long-term monitoring. Certain zones were cleaned more aggressively for future unrestricted use; others were left under institutional controls that limit what can be done on or under the ground. Contracts and consent orders set conditions the Army had to meet before parcels could be conveyed to non-federal owners.

Economically, the core mechanism for repurposing the land was the creation of a local redevelopment authority. In this case, the Great Plains Development Authority became the entity responsible for receiving most of the former plant and turning it into a civilian industrial park. The authority inherited a complex asset: thousands of acres of land, miles of roads and rail lines, ammunition storage igloos, and assorted buildings in various states of repair. It also inherited constraints: ongoing environmental monitoring, areas with restricted uses, and the perception that this was still, in some sense, a weapons plant in the countryside.

The transition to the Great Plains Industrial Park thus unfolded through staged property transfers, infrastructure investments, and marketing efforts. The site's new name and branding emphasized its acreage, multimodal transport access, and "shovel-ready" parcels. The development authority positioned the park as a place where new industries could grow, even as parts of the landscape still carried the physical and regulatory imprint of its prior mission.

3.2 Economic development narratives and the search for tenants

Once the ammunition plant was officially closed and rebranded, the Great Plains Development Authority faced a basic challenge: find tenants. An industrial park without occupants is not an economic engine; it is an empty label sitting over a large, underused tract of land. The authority therefore adopted the language and strategies of regional economic development, seeking to attract companies that could bring jobs and capital to Labette County.

The narratives used in this search follow familiar patterns. Promotional materials highlight the park's size, central location, rail access, and flexible parcels. The site is framed as a solution for companies needing space for warehousing, manufacturing, logistics, or energy projects. Local and state officials reinforce this framing by emphasizing workforce availability, a supportive business climate, and the community's eagerness for investment.

Over time, the park assembled a patchwork of tenants: small manufacturers, storage and logistics operations, and energy-related projects. Yet the scale of the site and the region's economic profile mean that large anchor tenants remained highly desirable. This is where the intersection with advanced nuclear and data centers becomes acute.

In an era of rapidly growing electricity demand, especially from energy-intensive computing infrastructure, the industrial park's available land, existing transmission connections, and relative isolation made it attractive as a proving ground. By advertising itself as a "Kansas Proving Grounds" and actively courting energy and high-tech projects, the park sought to position the former ammunition plant as a frontier of twenty-first century infrastructure rather than a relic of twentieth-century war production.

For local officials and development advocates, landing a company like Deep Fission or recruiting a major data center developer represents a symbolic and material victory. It signals that the

region is not being left behind in the new energy and information economy. The jobs, construction activity, and potential tax base associated with such projects are cast as lifelines for a rural county that has seen decades of industrial contraction.

These economic development narratives are not fabricated out of thin air. Communities genuinely need employment, and public institutions are under pressure to show progress. Nevertheless, the urgency of landing tenants can create a dynamic in which the risks and uncertainties of proposed projects are downplayed. When a site has become an emblem of "opportunity," questioning a high-profile project can be framed as anti-growth or disloyal, even when the concerns raised are substantive and grounded in the history of the land.

3.3 How memory fades: what local histories do and do not say

As the Great Plains Industrial Park has taken shape, the story told about the land has shifted. Official websites and promotional materials tend to describe the park in terms of acreage, logistics, and future potential. The wartime origins of the site and its role in cluster munition production are often compressed into a few paragraphs or omitted entirely. When the plant's past is mentioned, it is typically framed in neutral or nostalgic tones: a major employer during the war years, a symbol of national service, a chapter now closed.

This selective narration contributes to a gradual fading of the site's more troubling history. Younger residents may know the land primarily as an industrial park, a place where their relatives used to work "at the plant," or a location for occasional news stories about new tenants and ribbon cuttings. The 1989 explosion, the long debates over cluster munitions, and the details of environmental contamination become hazy or disappear.

Formal local histories and museum exhibits may reinscribe the plant as part of a broader regional story of resilience and adaptation. Churches, schools, and civic organizations may acknowledge veterans and war service more readily than they engage with the ethical controversies surrounding specific weapons. The dissonance between pride in contribution and discomfort with certain technologies can encourage silence.

None of this is unique to Parsons. Around the world, communities that hosted defense industries undergo processes of selective remembering and forgetting as sites are closed, redeveloped, and rebranded. Economic necessity encourages people to accept new uses of familiar land, and institutional narratives smooth over rough edges to attract investment. Over time, only fragments of the full history remain widely known.

Yet when that land is being asked to host a first-of-its-kind underground nuclear reactor, the fading of memory is not a neutral sociological fact. It becomes part of the ethical problem. If the community is encouraged to see the site only as a generic industrial park, the deeper context

that should inform present choices is obscured. The continuity between building controversial weapons and hosting an experimental reactor is not just technical; it is moral.

What local histories do say, and what they omit, therefore matters. A community that has fully confronted the legacy of its ammunition plant, including accidents and humanitarian controversies, is in a different position to evaluate new risks than a community that has been invited to focus only on future jobs. Rebranding risk without re-examining memory makes it easier to repeat patterns under new labels. Parsons stands at that juncture, balancing between honest remembrance and convenient forgetting as it considers what should be buried a mile beneath its soil.

4. Deep Fission's Gravity Reactor and the DOE Pilot Program

The proposal to place a nuclear reactor a mile under the ground outside Parsons is not a random experiment. It is the product of a particular technological vision and a newly created federal pathway designed to move that vision from slide deck to criticality in a very short time. Deep Fission's "Gravity" reactor takes the most common nuclear technology in use today, the pressurized water reactor, and relocates it from a surface containment dome to the bottom of a borehole drilled with oil-and-gas techniques.

On its own terms, the concept is meant to be reassuring: nothing exotic in the core physics, only a novel geometry and siting strategy. On the regulatory side, the Department of Energy's Reactor Pilot Program offers a way to authorize and operate such reactors on non–national lab sites, outside the traditional path of full commercial licensing. Together, these elements are presented as a bold but manageable step toward faster, cheaper, and more flexible nuclear power.

Yet the same features that make the Gravity concept appealing to its proponents also give rise to questions. Burying the reactor a mile deep reduces its surface footprint and visual impact, but it also complicates inspection, maintenance, and emergency response. A pilot program built around a fixed deadline for reaching criticality creates urgency, but it can also create pressure to downplay uncertainty. Parsons becomes the place where these tensions will be lived out in practice.

4.1 Technical overview of the mile-deep borehole reactor concept

Deep Fission's basic idea can be summarized in one sentence: take a small pressurized water reactor, put it in a narrow cylindrical vessel, and lower it on cables to the bottom of a one-mile-deep, thirty-inch-diameter borehole. The borehole is lined with steel casing, much like an oil or

gas well, and filled with water. The reactor and its associated steam generator sit at the bottom, in a compact assembly designed to fit within the borehole's diameter.

In this configuration, the reactor core operates at temperatures and pressures similar to those of conventional pressurized water reactors. The hydrostatic pressure comes not from a massive steel vessel at the surface but from the column of water above the core. A mile of water exerts a pressure on the order of 160 atmospheres, comparable to what standard PWRs maintain mechanically. Deep Fission's materials emphasize this as a key virtue: the Earth itself, via the water column, provides the pressure environment needed for reactor operation.

Heat generated in the core is transferred to water that circulates between the bottom of the borehole and the surface in a closed loop. As the heated water rises, it turns into steam that drives turbines located in a small surface power block. After passing through the turbines, the steam is condensed and returned down the borehole. In principle, the nuclear island is entirely underground; what remains at the surface looks more like a modest industrial building than a traditional nuclear plant with cooling towers and a large containment dome.

The Gravity reactor is designed as a small modular unit. Deep Fission describes each reactor as producing roughly 15 megawatts of electric power. Multiple boreholes can be drilled on the same site, allowing ten units to provide about 150 megawatts and one hundred units to approach 1.5 gigawatts. In this vision, an underground reactor field becomes a kind of nuclear "battery pack" that can be scaled up to meet the needs of data centers, industrial facilities, and possibly regional grids.

Technically, the company stresses three pillars. First, the reactor uses familiar low-enriched uranium fuel and PWR fuel assemblies from existing supply chains. Second, it relies on mature oil-and-gas drilling techniques to create the borehole and associated casing. Third, it borrows thermal management concepts from geothermal projects to move heat efficiently in the subsurface environment. By combining these, Deep Fission claims it can avoid the need for novel reactor physics or unproven materials, focusing instead on integrating established technologies in a new configuration.

The conceptual design, however, also introduces new engineering questions. Lowering and retrieving a reactor on cables through a narrow borehole requires robust handling systems and clear procedures for installation, inspection, and decommissioning. The long, slender geometry of the wellbore must withstand thermal and mechanical stresses over decades. Any defect in the casing or seals could create pathways for leaks that are difficult to detect or access. These challenges are acknowledged in technical white papers but are generally downstream of the headline message that the system is "radically simple."

4.2 The Department of Energy's Reactor Pilot Program and timelines

The institutional context for the Parsons project is the Department of Energy's Reactor Pilot Program, launched in 2025 after a presidential executive order directed DOE to reform its reactor testing processes. The program's mandate is explicit and ambitious: to authorize and operate at least three advanced reactor concepts, located outside of national laboratories, and to achieve criticality in those reactors by July 4, 2026.

To implement this mandate, DOE issued a request for applications, inviting companies developing advanced reactors to propose pilot projects. The agency signaled that it was willing to select more than three designs for participation, but that only a subset would realistically meet the criticality deadline. In August 2025, DOE announced an initial slate of eleven projects spanning different technologies, including sodium-cooled fast reactors, molten salt designs, and borehole pressurized water reactors such as Deep Fission's Gravity concept.

The Reactor Pilot Program differs from traditional nuclear development pathways in several important ways. Instead of pursuing full commercial licensing through the Nuclear Regulatory Commission from the outset, participants operate under DOE's own authority to construct and run test reactors at selected sites. The goal is to demonstrate core technologies, operating concepts, and safety cases at relatively small scale, then use the experience and data generated to inform later commercial deployments. The program is framed as a way to break out of the cycle of endless design work and no hardware.

Against this backdrop, Deep Fission's timeline for the Parsons site comes into view. Company statements and news reports describe a sequence in which the site selection is confirmed in 2025, groundbreaking occurs in December 2025, construction is substantially completed in the first half of 2026, and initial criticality is targeted for July 4, 2026. If all goes according to plan, a commercial-scale 150 megawatt plant using multiple boreholes could then be operational by 2028.

In practice, these dates are aspirational. Even supporters of the Reactor Pilot Program note that the schedule is extremely tight by nuclear standards, especially given that each design must still satisfy safety analyses, environmental reviews, and local permitting requirements. Nonetheless, the deadline is not merely symbolic; it is built into program documents and has become a rallying point for participating companies. The rhetoric of "reaching criticality by July 4" ties technological milestones to national narratives of independence and renewal.

For Parsons, this means that the community is not only host to a new reactor concept; it is host to a reactor concept under deadline. The compressed timeline, set at a national level, can influence how trade-offs are evaluated on the ground, how much time is allotted for local

engagement, and how willing developers and agencies are to slow down in response to emerging concerns.

4.3 Claims of safety, affordability, and invisibility

Deep Fission and its partners describe the Gravity reactor in terms meant to reassure both regulators and potential customers. Three themes recur in their public statements: safety, affordability, and invisibility.

On safety, the company emphasizes that the reactor is “inherently safer” by virtue of being placed a mile underground. In this framing, the surrounding rock and the column of water above the core provide “billions of tons” of passive shielding and containment, comparable to or better than the engineered containment structures built around surface reactors. In the event of a problem, the fission reaction taking place far below ground is portrayed as physically remote from people and ecosystems at the surface.

This argument relies on a shift from engineered to geological barriers. Traditional nuclear plants depend on thick steel vessels, concrete containment domes, and active cooling systems to manage heat and radioactivity. Gravity reactors, by contrast, depend on the integrity of the borehole casing, the stability of the surrounding rock, and the thermal and hydraulic behavior of the water column. Proponents argue that these natural systems, combined with a closed-loop design, reduce the likelihood and impact of releases. Critics point out that deep subsurface environments are complex, and that remediation of problems at such depths is much harder than in a surface facility.

On affordability, Deep Fission’s narrative centers on construction and deployment. By avoiding large-scale surface structures, the company claims it can eliminate up to 80 percent of surface construction costs, shorten project timelines, and sidestep many of the site-specific design challenges that plague conventional nuclear plants. The use of existing PWR components and standard drilling services is presented as a way to leverage mature supply chains rather than inventing everything anew. In principle, this modularity should also make it easier to build multiple units with similar designs, spreading fixed costs over a larger fleet.

Affordability in this context is not just about capital costs. It is also about the ability to offer predictable, long-term power purchase agreements to customers such as data centers, industrial facilities, and possibly municipal utilities. The promise is that a cluster of Gravity reactors can deliver firm, low-carbon power with fewer schedule surprises and cost overruns than traditional gigawatt-scale nuclear projects, making nuclear more competitive with natural gas and large-scale renewables plus storage.

Finally, invisibility is presented as both an aesthetic and a social benefit. Because the reactor sits at the bottom of a narrow borehole, there is no towering structure on the horizon to signal

“nuclear plant” to nearby residents. The surface facilities can be relatively low-profile, resembling other industrial buildings. This small footprint is framed as an advantage when siting reactors near load centers or in areas where land is at a premium. For communities wary of the stigma and perceived target value of visible nuclear plants, an underground system that “you hardly see” is marketed as less intrusive.

The Parsons project adds another layer to this invisibility claim. By placing the pilot reactor within the Great Plains Industrial Park, an already fenced and industrially zoned area, developers seek to normalize the presence of nuclear infrastructure as just one more use among many. The historical visibility of the site as an ammunition plant may actually aid this strategy: residents are accustomed to the idea that this land hosts high-consequence activities.

Yet invisibility has ethical downsides when applied to risk. A reactor that is literally and figuratively out of sight can more easily be out of mind. Visual cues that might prompt scrutiny or public debate are minimized. The reliance on subsurface systems can make it harder for outsiders, and even regulators, to develop an intuitive sense of how the reactor behaves and what failure modes might look like.

For Parsons, the interplay of safety, affordability, and invisibility is not an abstract marketing problem. It is a concrete question: to what extent should a community accept promises grounded in geological shielding and low visual impact, especially when made by a company whose technology has not yet been demonstrated at scale, under a federal program operating on a politically charged clock? The Gravity reactor offers one answer to the problem of how to make nuclear fit into a world of AI data centers and growing electricity demand. The deeper question is whether the way it seeks to be safe, cheap, and unseen aligns with the kind of safety, justice, and visibility that the people living above it would choose for themselves.

5. The Compute Horizon: AI, Data Centers, and New Power Demands

The decision to put a reactor under Kansas farmland is not happening in an energy vacuum. It is unfolding at a moment when global electricity demand is being reshaped by a new class of loads: hyperscale data centers, artificial intelligence training clusters, cryptocurrency mining, and other compute-intensive facilities. What used to be a relatively small share of total demand, tucked away in office parks and colocation facilities, is becoming a major driver of grid planning, transmission build-out, and generation investment.

In this context, nuclear power is being rediscovered not just as one option among many for decarbonization, but as a potential backbone for a compute-heavy future. The Gravity reactor is explicitly pitched into this space. Its modular size, claimed cost profile, and underground siting

are framed as answers to the question: how do you power clusters of energy-hungry machines that expect continuous, high-quality electricity for decades?

To understand why Parsons is attractive for a mile-deep reactor, one has to see it as a point on this much larger “compute horizon,” where digital infrastructure and energy infrastructure are converging. The former ammunition plant is not only being reimagined as an industrial park; it is being positioned, implicitly or explicitly, as a possible node in a national network of energy-compute hubs.

5.1 Rising electricity demand from AI and large data centers

Over the past decade, data centers have shifted from being background infrastructure to becoming visible actors in energy debates. The growth of cloud computing, video streaming, and e-commerce already pushed their electricity use upward. The recent explosion of interest in large language models, generative AI, and other machine-learning systems has accelerated that trend. Training a state-of-the-art model can consume as much electricity as thousands of households use in a year, and inference at scale multiplies that demand across millions or billions of user interactions.

This is not just a matter of a few spectacular training runs. Major technology firms are planning and building campuses that draw hundreds of megawatts each, often clustered in particular regions with favorable tax regimes, fiber connectivity, and access to power. What was once load that could be spread across many smaller facilities is now being concentrated in hyperscale sites that look, electrically, like industrial plants. These centers often run around the clock, with relatively flat load profiles that resemble a new kind of baseload.

Grid operators and utilities are beginning to grapple with the implications. In some regions, projected data center growth exceeds the capacity of existing generation and transmission within just a few years. New lines take a decade or more to build. The result is tension: technology firms want power quickly; regulators and utilities are constrained by infrastructure lead times and climate commitments. Short-term responses include delaying projects, turning back applications, or relying more heavily on natural gas. Longer-term responses involve revisiting the mix of resources that can provide firm, low-carbon power close to where it is needed.

From the perspective of the companies building these compute clusters, electricity is not a peripheral concern. It is a core input, on par with chip supply and software talent. Power costs affect operating margins; power reliability affects service quality and reputation. At the same time, investors and regulators increasingly scrutinize the carbon intensity of that power. The net effect is to push data center developers to look for arrangements that are cheap, clean, and controllable, yet not hostage to the slowest pieces of traditional grid expansion.

5.2 Why underground nuclear is attractive to a compute-hungry world

Into this landscape, Deep Fission and similar companies insert a particular proposition: small, modular reactors, buried underground, co-located with or near large loads such as data centers, can serve as dedicated or semi-dedicated power plants for the digital economy. Several features of the Gravity concept speak directly to the priorities of compute-hungry actors.

First, the reactors are designed to provide firm power. Unlike wind and solar, which are variable and require storage or backup to provide constant supply, a borehole reactor aims to deliver a steady output for long periods between refueling. For data centers that operate continuously and cannot easily ramp their load up and down, this is a significant advantage. It reduces dependence on spot markets and mitigates exposure to volatility in fuel or carbon prices.

Second, the modularity and physical footprint of the design promise a kind of scalability that aligns with data center growth. Instead of committing to a single, massive nuclear plant that may take a decade to build and license, a campus could in principle add reactors over time as demand expands, drilling new boreholes and dropping in additional units. The dense power output per unit of land means that even a sizable cluster of reactors occupies a relatively small surface area, which is valuable when integrating with other infrastructure on the same site.

Third, underground siting addresses several siting and perception challenges. Traditional nuclear plants are highly visible and often face local resistance based on concerns about aesthetics, property values, and perceived risk. A reactor that occupies little surface space and presents few visual cues may encounter less immediate opposition, especially in industrial zones. For data center firms that prefer not to advertise the presence of nuclear power in their marketing materials, the subterranean design offers a way to separate the brand from the source of energy in the public imagination, even while relying on it in practice.

Fourth, security and resilience arguments are easier to make when critical components are buried. A reactor at the bottom of a mile-deep borehole is harder to target with physical attack and less exposed to certain natural hazards. Coupled with hardened transmission links and on-site backup systems, this makes it possible to pitch an energy-compute hub as an infrastructure asset with high survivability in the face of storms, wildfires, or even intentional disruption.

Finally, the narrative of “energy abundance” meshes with the aspirations of technology firms that see AI and computation as engines of growth. Underground reactors can be framed as enabling a future where energy is no longer the binding constraint on scaling models and services. By locating new nuclear capacity close to demand, rather than relying solely on distant renewable projects and long-distance transmission, proponents argue that one can unlock faster deployment and higher utilization of computing resources.

Of course, all of these attractions come with conditions. The economic case depends on real, not just promised, cost reductions. The safety case depends on the long-term performance of boreholes and subsurface systems. The social case depends on communities accepting reactors in their backyards so that data centers elsewhere can operate smoothly. It is precisely this last condition that makes places like Parsons central to the story.

5.3 Parsons as a potential energy-compute hub rather than an isolated project

Official statements about the Parsons Gravity reactor emphasize its status as a pilot: a first-of-its-kind demonstration meant to prove out technology and processes. Taken at face value, this might suggest a bounded experiment with limited implications for the local community. Once the pilot is complete, so the story might go, lessons can be applied elsewhere.

Yet the agreements and language surrounding the project tell a different story. The Great Plains Development Authority and Deep Fission have signaled an intention to pursue a full-scale commercial project at the same site if the pilot is successful. The industrial park simultaneously markets itself to data center developers and other energy-intensive tenants. This pairing is not accidental. It implies a future in which the acreage once used for munitions production becomes a coordinated complex of underground reactors and surface-level computing or industrial loads.

In such a scenario, Parsons is not hosting a single experimental reactor. It is anchoring a regional or even national energy-compute hub. Multiple boreholes could be drilled over time, turning the subsurface into a dense cluster of nuclear units. Aboveground, data halls, cooling systems, and network infrastructure could proliferate. High-voltage lines might be reinforced or added, not just to bring power in but to export surplus electricity or provide grid services.

This transformation would have cascading effects. On the upside, it could bring jobs, contracts for local suppliers, and increased tax revenues. Training programs at nearby educational institutions might align with reactor operations and data center maintenance, reshaping the local skills profile. On the downside, it could lock the community into a long-term dependence on a specific configuration of technologies and corporate actors, with limited flexibility if conditions change. The presence of a deep reactor field and associated covenants could constrain other land uses for generations.

Moreover, the symbolic meaning of the place would shift again. A site once defined by its role in supplying weapons might become known for supplying power to distant servers that mediate much of modern social and economic life. For some, that may feel like progress. For others, it may look like a subtler form of the same pattern: local land and risk leveraged in service of external priorities, with limited say from those who live nearby.

From a national perspective, Parsons could become a template. If an underground reactor powering or flanking data centers in southeast Kansas is seen as a success, it will be easier to argue for similar deployments in other rural or post-industrial regions. If problems arise, the consequences will likewise reverberate beyond the county line. Either way, the town is an early test of whether communities can genuinely shape the terms on which they participate in the emerging alliance between advanced nuclear and advanced computation.

Seen in this light, the Parsons project is not just an energy pilot. It is a social and political pilot: an experiment in how far the promise of jobs and "energy abundance" can carry a community into an infrastructural future that is being designed elsewhere, but rooted literally beneath its feet.

6. Stacking High-Consequence Technologies in Quiet Places

The story of Parsons is not anomalous; it is an instance of a larger pattern in which high-consequence technologies are preferentially placed in communities with limited voice, political leverage, or economic alternatives. Such places are often rural, deindustrialized, or otherwise on the margins of national attention. They may be deeply intertwined with the very institutions that decide their fate, yet rarely command the power to redirect those decisions.

When a former ammunition plant becomes an industrial park and then a candidate for an underground nuclear reactor, this pattern becomes visible in cross-section. The same landscape that once hosted weapons production now becomes a proving ground for experimental energy systems, with the prospect of data centers and other critical infrastructure layered on top. Each new technology arrives with its own justifications, jobs promises, and safety narratives. Each new arrival is evaluated, officially, as though it were a separate decision. But in reality the risks and meanings accumulate.

Parsons thus sits at the intersection of environmental justice, energy policy, and technological ambition. To see what is at stake, it is necessary to situate the town within broader historical siting practices, compare its trajectory with other nuclear and industrial locales, and examine how the layering of weapons legacy, contamination, and advanced nuclear reshapes both physical and moral risk.

6.1 Historical patterns of siting risk in rural and marginalized communities

Across the twentieth and twenty-first centuries, hazardous and high-consequence facilities have not been sited randomly. They have tended to cluster in places where land is relatively cheap, opposition is easier to manage, and existing political or economic arrangements make it difficult for residents to say no. Rural areas, Native lands, poor urban neighborhoods, and

deindustrialized regions have frequently borne the burden of nuclear waste repositories, petrochemical complexes, refineries, hazardous waste incinerators, and military installations.

Several mechanisms drive this pattern. One is straightforward economics: projects that require large tracts of land, buffer zones, and extensive infrastructure are easier to build in sparsely populated areas where property acquisition costs are lower. Another is political leverage: communities that are already dependent on a single employer, or that have lost major industries, are more likely to accept new facilities in exchange for promised jobs and investment. A third is perception: risk imposed on distant, less visible places tends to provoke less public outcry than risk imposed near affluent or politically connected centers.

The siting of weapons plants and nuclear facilities has often followed this script. Army ammunition plants were located in rural counties with rail access. Uranium mining, enrichment, and weapons testing disproportionately affected Indigenous communities and remote desert regions. Nuclear power plants were frequently placed near water bodies in less densely populated zones, sometimes with the explicit reasoning that evacuations would be more manageable in an accident.

Environmental justice scholarship has documented how race, income, and political power correlate with exposure to industrial hazards. While not every rural community is marginalized in the same way, the overall pattern is clear: some places become sacrifice zones where risk-intensive infrastructure is normalized, while others function primarily as consumers or beneficiaries of the services such infrastructure provides. The fact that residents may welcome jobs and investment does not erase the asymmetry; it highlights the constrained set of choices they face.

Parsons, with its history as a munitions hub and its current position as an industrial park courting advanced energy projects, fits this broader landscape. It is a community whose land has long been treated as a platform for national projects that would be much harder to site in suburbs of major cities or in regions with more organized opposition.

6.2 Parsons in comparison with other nuclear and industrial sites

To understand what is distinctive about Parsons, it is useful to compare it with other places that host nuclear or high-risk industrial facilities. Traditional nuclear power plants, for example, are often located near coastlines or major rivers to secure cooling water, and they tend to be integrated into regional grids serving large populations. Communities near such plants sometimes gain more direct benefits in the form of jobs, local tax revenue, and infrastructure investment, but they also become associated with the stigma and anxiety surrounding nuclear accidents. The plants themselves are highly visible, with recognizable silhouettes and security perimeters that mark them as exceptional.

By contrast, facilities such as uranium mills, enrichment plants, nuclear weapons assembly sites, and long-term waste repositories have often been located in regions with smaller populations and less economic diversity. These sites frequently combine technical opacity with political remoteness: their operations are difficult for outsiders to understand and are insulated, to varying degrees, from continuous public scrutiny. When accidents occur or contamination is discovered, affected communities may struggle for recognition and remediation.

Parsons shares features with both categories. On one hand, the proposed Gravity reactor is framed as a grid-connected resource that will support broader regional needs, including potentially the power demands of distant data centers. On the other hand, its siting within a former weapons complex and an industrial park locates it firmly within a tradition of placing complex, high-risk activities in out-of-the-way places previously marked by military or industrial use.

What distinguishes Parsons further is the combination of historical and proposed uses. Many nuclear sites were built on relatively undeveloped land and then, over decades, accumulated their own legacies. In Parsons, the proposed reactor does not initiate a new chapter on blank ground; it inserts itself into a site that already carries the weight of munitions production, cluster bomb accidents, and incomplete environmental cleanup. The Great Plains Industrial Park is not merely proximate to a weapons plant; it is the same land under a new administrative and branding regime.

Comparisons also highlight differences in public engagement. Major nuclear projects in other locations have sometimes been accompanied by intensive public debate, litigation, and national media attention. A borehole reactor at a former ammunition plant in southeast Kansas is less likely to command sustained coverage beyond the region, especially if it is presented as a technical pilot under a Department of Energy program rather than a large, stand-alone commercial facility. This relative quiet makes it easier for developers and officials to proceed with less contestation, but it also reduces the opportunities for broader scrutiny and learning.

6.3 Risk layering: weapons legacy, contamination, and advanced nuclear

The concept of risk layering captures how different types of hazard and uncertainty accumulate on the same physical and social terrain. In Parsons, at least three layers are immediately visible: the weapons legacy of the Kansas Army Ammunition Plant, the residual contamination and regulatory constraints that remain after closure and partial cleanup, and the proposed addition of an advanced underground nuclear reactor.

The weapons legacy is both material and symbolic. Materially, the decades of ammunition production have left behind infrastructure, altered hydrology, and areas of contaminated soil and groundwater. Symbolically, the plant ties the land and local labor to conflicts and weapons

systems whose human consequences extend far beyond Kansas. This legacy shapes how the site is perceived by those who remember its operations and by those who study the ethics of particular weapon types.

The contamination layer is technical and legal. Corrective actions may have reduced immediate exposure risks, but monitoring and institutional controls persist. Certain parcels may have use restrictions; certain subsurface zones may be known or suspected to contain residues. These realities impose constraints on future development and create uncertainty about how the subsurface will behave under new stresses, such as the thermal and mechanical effects of a reactor-bearing borehole.

The proposed advanced nuclear layer introduces new dimensions of risk. Operating a pressurized water reactor at the bottom of a mile-deep borehole entails uncertainties about long-term casing integrity, rock behavior, and the management of heat and radioactivity in a complex subsurface environment. While the reactor's physics may be familiar, the geometry and siting are not. In the event of unanticipated interactions between the reactor system and existing contamination, or between new wells and old waste disposal areas, the complexity of the subsurface could amplify both the difficulty of diagnosis and the challenge of remediation.

Beyond physical interactions, the layering of risks affects governance. When a site already has a history of partial cleanup and negotiated reuse, new projects must interface with existing regulatory commitments and community expectations. There is a danger that each new layer is assessed in isolation, with its own environmental impact statements and public comment periods, rather than in terms of the cumulative burden on land and people. Risk becomes fragmented into manageable pieces on paper, even as it accumulates in the real world.

Finally, risk layering has a temporal dimension. Decisions made in the 1940s to locate an ammunition plant in Labette County generated consequences that are still unfolding in the form of environmental monitoring and contested memory. Decisions made in the 2020s to locate an underground reactor on the same land will project new consequences forward, possibly into the next century. Parsons becomes a point where multiple long-lived technological trajectories intersect.

Recognizing this stacking does not, by itself, dictate a single policy outcome. It does, however, challenge any narrative that treats the Gravity reactor as a simple, isolated innovation. When weapons legacy, contamination, and advanced nuclear are viewed together, the ethical question becomes sharper: how many layers of high-consequence technology can be placed on the same quiet ground before the presumption shifts from "this is an appropriate site" to "this place has already given enough"?

7. Consent, Churches, and Community Voice

The story of Parsons is not only about technology and policy; it is also about the condition of the community's moral infrastructure. When someone observes that there are "no churches to stop it," they are not literally claiming the absence of church buildings. They are pointing to a perceived collapse of institutions that once might have convened hard conversations, framed decisions in moral terms, and given ordinary people a collective way to say "no" or "not like this" to projects imposed from outside.

In earlier eras, churches, civic groups, and local newspapers formed a web of meaning-making and mutual accountability. Economic decisions, especially those that carried obvious risks, were debated not only in council chambers and company boardrooms but in Sunday school classes, town halls, and living rooms. Today, that web is thinner. Congregations are smaller or more fragmented; local journalism is weakened; many residents are occupied with simply holding their lives together. Into that space, projects arrive already wrapped in polished press releases and assurances of community "engagement."

The question, then, is not only whether Parsons will host an underground reactor. It is whether the people who live there have the tools—spiritual, intellectual, and civic—to understand what is being asked of them and to respond in a way that reflects their own values rather than merely accommodating someone else's timeline.

7.1 "No churches to stop it": moral infrastructure and its erosion

The phrase "no churches to stop it" captures a sense of absence: not the absence of religion as such, but the absence of institutions willing to exercise moral friction against the momentum of economic and technological projects. Churches in many small towns still gather people, teach scriptures, and perform rituals, but often avoid direct engagement with contested local decisions, especially when those decisions are framed as economic opportunities or as matters of "science and policy" beyond their remit.

Historically, churches have played varied roles in relation to industrial and military projects. In some cases, pastors blessed new factories and plants, offering theological cover for national projects. In others, faith communities became centers of resistance, challenging unsafe working conditions, environmental harms, or unjust wars. Whether they acted as chaplains to power or as prophets against it depended on their theology, leadership, and ties to the affected people.

In places like Parsons, the long association between the plant and "supporting the troops" blurred moral lines. Working at the ammunition plant was both an economic necessity and, in many narratives, a form of patriotic service. Churches that ministered to plant workers were unlikely to openly question the ethics of particular weapons, especially during times of war. Over time, this alignment can dull the capacity to scrutinize new projects critically. When an

underground reactor is presented as part of national energy independence and economic resilience, it is easy for churches to default to blessing once again.

Moral infrastructure erodes not only through explicit choices but through neglect. When congregations focus almost exclusively on personal piety, individual salvation, or internal church disputes, they leave a vacuum around public decisions. When sermons avoid naming concrete local issues, congregants learn that faith is something practiced in private rather than brought to bear on shared risks and opportunities. The result is a community where churches are present, but their capacity to convene deep discernment about an underground reactor—or any other high-consequence project—is minimal.

Rebuilding moral infrastructure does not mean turning churches into political action committees. It means recovering their role as places where people ask what it means to love their neighbors, steward creation, and protect the vulnerable in the face of specific proposals. Without that, decisions default to whoever controls the language of investment and innovation.

7.2 Formal processes versus lived consent: hearings, comment periods, and real understanding

On paper, projects like the Deep Fission reactor in Parsons come with mechanisms for public participation. Environmental review processes include scoping meetings and comment periods. Development authorities may hold informational sessions. Local officials may vote in open meetings. Companies emphasize “transparent engagement” and their commitment to listening. These processes are important, but they can easily become ritualistic.

Formal consent mechanisms suffer from several structural limitations. The first is asymmetry of knowledge. Developers and agencies arrive with teams of engineers, lawyers, and communications professionals. Residents arrive with everyday expertise in their own lives and local conditions, but rarely with deep familiarity in reactor physics or subsurface engineering. Technical documents are long, dense, and filled with jargon. Presentations are often designed to reassure rather than to invite genuine grappling with uncertainty. In such conditions, many people nod along or remain silent, not because they agree, but because they are not confident in their ability to challenge what they are being told.

The second limitation is asymmetry of time and resources. Attending hearings or reading environmental impact statements requires time that many people do not have, especially those working multiple jobs or caring for family members. Those who can show up and speak are not necessarily those most affected. Meanwhile, the project’s proponents are paid to be present, to follow the process closely, and to adjust their strategy as needed.

A third limitation is the framing of the choice. By the time the public is invited to comment, the basic shape of the project is usually fixed. The questions on offer tend to be narrow: where to

route a line, how to mitigate a specific impact, what monitoring regime to adopt. The larger questions—whether this technology should be sited here at all, whether alternative investments might be better aligned with community values—are treated as already settled. In this environment, consent becomes the acceptance of minor adjustments, not a genuine capacity to say “yes” or “no” to the core proposal.

Lived consent looks different. It would involve residents understanding not only the official safety case but also the range of plausible failure modes, the long-term commitments they are being asked to accept, and the distribution of benefits and burdens. It would require time for questions that do not fit neatly into pre-prepared slide decks. It would mean that saying “no” is seen as a real option, not as a betrayal of the community’s economic interests.

In Parsons, the gap between formal process and lived consent is widened by the site’s history. Many residents already experienced the plant as something given from outside, not chosen. Their parents or grandparents may have worked there out of necessity, not preference. For them, being asked to participate in “engagement” about an underground reactor may feel less like empowerment and more like being enlisted to legitimize a decision already made.

7.3 Roles for faith communities, educators, and local professionals in discernment

If consent is to be more than a slogan, trusted local institutions and individuals must help translate complex proposals into terms that residents can understand and evaluate. In Parsons, as in many small communities, three groups are especially well-positioned to play this role: faith communities, educators, and local professionals.

Faith communities, including churches, can provide spaces where moral questions are asked openly, outside the scripts of corporate presentations and government hearings. A pastor or lay leader does not need to be a nuclear engineer to ask whether a project aligns with the congregation’s understanding of stewardship, care for the vulnerable, and responsibility to future generations. Bible studies or adult education classes can host discussions that connect scriptural themes with the concrete realities of an underground reactor: what it means to rely on geological shielding, how to think about long-lived risks, and how to weigh promised economic benefits against possible harms.

Educators, especially at local colleges and high schools, can help bridge the technical gap. A community college physics instructor, an environmental science teacher, or a historian of technology can organize public lectures or workshops that explain reactor concepts, environmental review processes, and the history of the site in accessible language. Students can be engaged in projects that map the site’s history, analyze public documents, and interview residents. By turning the reactor proposal into an educational opportunity rather than a black box, schools can strengthen the community’s capacity to deliberate.

Local professionals—doctors, nurses, hydrologists, geologists, emergency managers, engineers, and lawyers—also have crucial roles. They can independently review aspects of the project within their expertise, identify unanswered questions, and communicate their concerns or endorsements in plain language. A local physician might focus on emergency preparedness and potential health impacts. A hydrologist might examine groundwater interactions. An emergency manager might assess evacuation plans and communication protocols.

For these roles to be effective, they must be exercised with a degree of independence from both project proponents and political pressures. A church that is financially dependent on donations from a key business leader, a school dependent on a corporate grant, or a professional whose firm stands to gain contracts may find it difficult to ask hard questions. Recognizing these conflicts and addressing them openly is part of genuine discernment.

In an ideal scenario, these groups collaborate. A church might host a community forum where a college instructor explains technical basics and a local geologist answers questions. A panel might include both supporters and skeptics of the project, with ground rules emphasizing respect and clarity rather than persuasion. The goal is not to manufacture consensus but to raise the level of understanding and to articulate a local moral vocabulary for evaluating the reactor.

Parsons does not need to become a center of anti-nuclear activism to reclaim its voice. It needs to ensure that, whatever decision is ultimately made, it is made with eyes open, with a clear memory of the land's past uses, and with institutions that are willing to say more than "we were told it will be fine." Faith communities, educators, and local professionals are not the only actors in this work, but without their engaged participation, the promise of community involvement risks remaining just that—a promise, rather than a practice.

8. Engineering Narratives and Engineered Unreality

The Gravity reactor in Parsons is a machine, but it is also a story. Before any concrete is poured or steel is lowered down a borehole, the project exists as a narrative constructed by engineers, executives, and public officials. That narrative is not ornamental. It shapes how regulators interpret risk, how investors see opportunity, and how local residents understand what is being proposed beneath their land.

In the case of Parsons, the dominant storylines are familiar: energy abundance, national independence, and technological inevitability. The reactor is framed as a solution to climate change, a shield against foreign energy shocks, and a necessary step in powering an AI-heavy future. Uncertainties and unknown failure modes are acknowledged, if at all, in technical

appendices or brief asides. On the surface, the project appears as a neat alignment of engineering ingenuity and public good.

Yet when the narrative is examined closely, it looks less like a transparent explanation of reality and more like a carefully engineered unreality: a selective picture that brackets out inconvenient facts and compresses long chains of causality into confidence-inspiring slogans. The Parsons pilot becomes not only an engineering experiment but a test of how far such narratives can carry high-consequence decisions before hard questions reassert themselves.

8.1 Abundance, independence, and inevitability as rhetorical tools

Three words recur in promotional materials and political endorsements around advanced nuclear projects: abundance, independence, inevitability. Each plays a specific rhetorical role.

Abundance appeals to a basic anxiety about scarcity. The promise of "energy-abundant America" suggests a future where power is so plentiful that difficult trade-offs disappear. In this framing, a Gravity reactor under Kansas soil is not merely one more generator; it is a symbol of a world in which constraints on economic growth, digital services, and industrial production are loosened. Every kilowatt-hour seems to carry not only electrons but freedom from limits.

Independence taps into national and regional pride. By emphasizing domestic uranium, domestic technology, and domestic construction, proponents position the reactor as a bulwark against foreign influence and geopolitical shocks. For communities that have seen factories close and jobs shipped elsewhere, the idea that a cutting-edge reactor will help "keep America strong" and "lower energy rates for Kansans" can be deeply resonant. It offers a sense that the town is again doing its part, this time in the energy transition rather than in wartime production.

Inevitability is the quietest but perhaps the most powerful tool. It is the suggestion that, whatever doubts one might have, technologies like underground reactors are coming. As electricity demand from AI and data centers rises, as climate deadlines tighten, as old coal and gas plants retire, the argument goes, there will simply be no alternative but to build advanced nuclear. Under this logic, Parsons is not being asked whether it wants to participate in a bold experiment; it is being told that it has the opportunity to be "ahead of the curve" on a path that others will eventually have to follow.

These rhetorical tools are effective because they are not wholly false. The world does face real energy and climate challenges. Overdependence on distant fossil fuel supplies has genuine geopolitical costs. Some technological trajectories, once set in motion, are difficult to reverse. But when abundance, independence, and inevitability are deployed as overarching narratives, they can drown out more granular questions about *this* reactor, *this* site, and *this* community.

8.2 How optimistic narratives mute structural uncertainty and unknown failure modes

Engineering narratives tend to highlight what is known and controllable. They describe design features, safety margins, and regulatory oversight. They invoke simulations and experience with related technologies. The unknowns and structural uncertainties are not entirely ignored, but they are relegated to the margins of the story, presented as manageable rather than fundamental.

In the case of a mile-deep borehole reactor, there are at least three categories of uncertainty that optimistic narratives tend to mute. First, there is subsurface complexity. Rocks are not uniform blocks, and boreholes are not perfect cylinders. Fractures, faults, and variations in geology can affect heat transfer, fluid flow, and mechanical stability over time. Predictions are based on models and limited samples, not on decades of operating experience with reactors at such depths.

Second, there are systemic interactions. The reactor will not exist in isolation. It will be connected to local and regional grids, embedded in an industrial park with other facilities, and subject to climate stresses like heat waves and extreme weather. Failure modes can emerge not only from component breakdowns but from unexpected interactions among systems: a communication failure that coincides with a grid disturbance and a maintenance outage, for example, or a combination of supply chain disruption and regulatory delay that complicates repairs.

Third, there are institutional uncertainties. The durability of safety culture, the continuity of regulatory oversight, and the alignment of corporate incentives with long-term stewardship are not guaranteed. Ownership structures can change; companies can be bought, sold, or restructured. What begins as a tightly managed pilot can evolve into a complex asset whose future is shaped by distant financial decisions.

Optimistic narratives often flatten these uncertainties by emphasizing best-case scenarios. They describe how the reactor is supposed to operate, how the geology is expected to behave, and how institutions intend to perform. They may mention backup systems and emergency plans but do so in a way that reinforces confidence rather than inviting critical scrutiny. In doing so, they contribute to an engineered unreality: a public picture in which deep structural unknowns are translated into reassuring bullet points.

For a community like Parsons, this unreality has consequences. Residents are asked to consent to a project under conditions where the full range of uncertainties is neither clearly articulated nor meaningfully discussed. The story they hear is less about “this might work but we do not fully know how it will behave over fifty years” and more about “this is safer, cheaper, and more

reliable than the plants you have seen on television." Consent under such narratives is not entirely uninformed, but it is shaped by a carefully curated understanding of risk.

8.3 From mutual assured destruction to mutual assured dependence on hidden infrastructures

In the Cold War, the Kansas Army Ammunition Plant contributed to a strategic posture often summarized as mutual assured destruction. The logic was brutal but simple: the possession of vast arsenals, including nuclear weapons and their delivery systems, would deter adversaries from initiating conflict, because any attack would trigger devastating retaliation. Ordinary citizens were not asked to approve the details of targeting plans or warhead designs; they were asked to trust that the existence of these weapons kept them safe.

In the emerging energy-compute landscape, a subtler configuration is taking shape: mutual assured dependence on hidden infrastructures. The Gravity reactor in Parsons, if successful and replicated, would become part of a network of underground reactors, high-voltage lines, data centers, and control systems that collectively sustain the digital services on which economies and daily life increasingly rely. These infrastructures are geographically dispersed but tightly coupled. A serious failure in one node can ripple outward, not as a literal mushroom cloud but as cascading outages and disruptions.

The dependence is mutual in several senses. Data centers depend on reactors or other firm power sources to operate; reactors depend on data centers or grid demand to justify their existence; both depend on stable regulatory, financial, and physical conditions to function. Society, in turn, comes to depend on the composite system for everything from medical records to banking to communication. As layers accumulate, the possibility of opting out diminishes.

What distinguishes mutual assured dependence from earlier eras is its invisibility. The Ammunition Plant was a visible complex with clear symbolic associations. People knew it was there and roughly what it did. An underground reactor powering distant clusters of servers is less obvious. Its risks are mediated through layers of infrastructure and abstraction. Failures may manifest not as explosions but as unexplained blackouts, data loss, or subtle degradation of services.

Engineering narratives can make this mutual dependence sound benign: a seamless integration of energy and information infrastructures delivering prosperity. The danger is that, like the logic of mutual assured destruction, it contains fragilities that are difficult to see from inside the story. When much of life comes to depend on tightly coupled, high-consequence systems that are physically and conceptually out of sight, societies can drift into a state where they are both highly resilient to everyday fluctuations and deeply vulnerable to rare, systemic shocks.

Parsons sits in the foreground of this transition. The town's land is being invited to host one of the systems on which this new dependence may rest. The decision is being narrated as an opportunity for local jobs and national leadership. The deeper question is whether the community, and the broader public, understand the kind of world they are helping to build: not only one with more energy and more computation, but one in which the basic conditions of life are tethered to infrastructures that few can see and fewer still genuinely understand.

9. Ethical Gating Functions for Underground Reactors

If underground reactors are not simply to be "the next big thing" imposed on places like Parsons, they need more than a technical safety case. They need ethical gating functions: clear, non-negotiable conditions that must be met *before* construction and *before* any scaling from pilot to commercial fleet. These are not afterthoughts or public-relations gestures; they are structural filters that determine whether a project is permissible at all, and if so, under what continuing obligations.

For Parsons and similar sites, three clusters of gating functions stand out. First, minimally adequate safety and transparency requirements that go beyond regulatory minimums and marketing slogans. Second, hard constraints around groundwater, geology, inspection, and emergency planning, recognizing the irreversibility of deep subsurface interventions. Third, criteria for community benefit and reciprocity that address the problem of asymmetric gain between host communities and distant beneficiaries of compute and energy.

Taken together, these functions turn the question from "How do we convince people this is safe enough?" to "Under what specific, checkable conditions would it be right to put this here at all?"

9.1 What minimally adequate safety and transparency would require

A minimally adequate ethical standard for an underground reactor cannot simply replicate the legal minimum. It must reflect the fact that the host community is being asked to bear long-lived, partly unknown risks so that others—regional grids, national energy planners, AI firms—can reap substantial benefit. The bar should therefore be higher than "no obvious red flags." At least five elements are essential.

First, a *conservative safety case* that explicitly addresses deep uncertainty. This means not just point estimates and best-case scenarios, but structured analysis of worst credible cases and partial knowledge. Sensitivity analyses, uncertainty ranges, and explicit acknowledgement of what is not yet known about borehole behavior over decades should be central, not buried in

appendices. A project that cannot survive explicit engagement with its own worst cases should not proceed.

Second, *independent technical review* with real power. Safety and design documents should be examined not only by regulators and company-hired consultants, but by independent panels that include hydrogeologists, nuclear engineers, and risk analysts with no financial stake in the project. Their reports should be public, their disagreements visible, and their recommendations treated as binding unless specific, transparent reasons are given for deviation.

Third, *plain-language documentation and dialogue*. Ethical adequacy requires that non-specialists in the host community can understand the core features of the design, its failure modes, and the proposed mitigations. This does not mean everyone becomes a reactor engineer, but it does mean that key documents and presentations are written for lay readers, translated where necessary, and presented repeatedly in accessible formats. Jargon-heavy slide decks are not enough.

Fourth, *data transparency and ongoing monitoring*. Once the reactor is operating, key performance indicators—thermal behavior, borehole integrity metrics, groundwater monitoring data, and incident logs—should be published in at least two forms: technical detail for specialists and periodic plain-language summaries for the community. A project that operates as a black box, with only occasional press releases, fails this test.

Fifth, *institutional safeguards*, including whistleblower protections and long-term responsibility structures. Employees and contractors must have safe channels to report concerns without fear of retaliation. Ownership and liability arrangements must be robust against corporate restructuring; there should be named entities responsible for the reactor and site stewardship for the full lifetime of the facility and its aftercare, not just during the early, optimistic years.

In short, minimally adequate safety and transparency mean that the host community is not asked to trust assurances it cannot verify. It means that the people living above the reactor have access to the same core information as investors and distant policymakers, in a form they can use. Anything less is not consent; it is acquiescence.

9.2 Groundwater, geology, inspection, and emergency planning as hard constraints

For a borehole reactor, certain aspects of the physical environment are not negotiable. Groundwater, geology, the ability to inspect and maintain critical components, and the realism of emergency planning are hard constraints. If they cannot be satisfied to a high standard, no amount of economic benefit or technological enthusiasm should override them.

On groundwater, the baseline requirement is a detailed, independently verified hydrogeological characterization of the site. This includes mapping aquifers, flow paths, and existing

contamination plumes, as well as modeling how the thermal and mechanical effects of a reactor-bearing borehole could alter these over time. Monitoring wells must be installed in sufficient number and depth to detect any migration of contaminants early. If there is significant uncertainty about interactions between the borehole, casing, and water-bearing strata—especially in a site with prior contamination history—the gating function should trip: no reactor.

Geology is similarly fundamental. The rock column surrounding the borehole must be characterized not only for drilling feasibility but for long-term stability under thermal cycling and mechanical stress. Faults, fractures, and zones of weakness must be identified and conservatively treated. The question is not merely "can we drill here?" but "will this rock reliably contain and support this system over the full life of the reactor and beyond?" If the answer is "we do not know," the ethical response is to wait or choose another site, not to accept the unknown.

Inspection and maintenance are often underplayed in optimistic narratives, but they are central to ethical gating. A reactor at the bottom of a mile-deep borehole is, by design, difficult to access. Therefore, the operator must demonstrate credible, tested methods for inspecting the reactor, the borehole casing, and associated components at intervals that match the risk profile. This may involve downhole instrumentation, retrievable logging tools, or even periodic retrieval of the reactor assembly itself. If there is no realistic way to detect and repair degradation before it becomes dangerous, the design should not be deployed at all. "Passive safety" cannot be an excuse for inaccessibility.

Emergency planning is the last hard constraint in this cluster. For a conventional surface plant, emergency planning zones, evacuation routes, and communication protocols are well-established, if sometimes imperfect. For a deep borehole reactor in a rural community, these plans must be rethought in detail. What does a credible worst-case accident look like? How would it be detected? What are the time scales for potential releases? How would information reach residents, including those far from digital channels? What are the roles of local hospitals, schools, and law enforcement? Drills should be conducted with the actual community, not just on paper. If emergency scenarios are so poorly understood, or the response so dependent on distant institutions, that a prompt, effective reaction cannot be guaranteed, the reactor fails the gating test.

These constraints are not obstacles to be negotiated away; they are thresholds. A community like Parsons has already lived with the consequences of underappreciated groundwater and contamination issues. Asking it to accept a new deep subsurface technology without robust answers to these questions would be to repeat old mistakes under new language.

9.3 Community benefit, reciprocity, and the problem of asymmetric gain

Even if a borehole reactor meets high standards of safety and transparency, a further ethical question remains: how are the benefits and burdens distributed? In Parsons, as in many host communities, there is a risk of asymmetric gain. Local residents bear the land-use change, the proximity to risk, and the long-term constraints on alternative futures for the site. The primary beneficiaries may be distant: national energy planners, corporate data center operators, and investors.

An ethical gating function therefore must address reciprocity and community benefit in concrete terms, not as vague promises of "jobs and growth." Several elements are central.

First, *a guaranteed host-community dividend* that is tied to the reactor's operation, not just to construction. This could take the form of a dedicated fund, capitalized by a fixed amount per megawatt-hour generated, that is controlled locally and used for community priorities: schools, health care, environmental restoration, or diversification of the local economy. Crucially, this fund should be protected against corporate bankruptcy and political turnover; it is part of the price of using this land for high-consequence technology.

Second, *property value and livelihood protections*. Residents living within defined zones around the site should have access to mechanisms that prevent them from bearing hidden economic costs. These might include property value guarantees (compensating owners if reactor-related stigma depresses prices below baseline trends), health monitoring programs, and preferential hiring and training opportunities that match local capabilities. Jobs promised must be real, sustained, and accessible, not limited to a narrow band of highly specialized positions imported from elsewhere.

Third, *meaningful community leverage over expansion*. Often, pilot projects are used to normalize an infrastructure pattern that is later scaled up dramatically. A gating function for reciprocity would require that any expansion—additional boreholes, larger reactor arrays, integration with data centers—triggers a fresh round of consent, not just a continuation of the initial approval. Local oversight bodies, including representatives from civil society, faith communities, and technical experts, should have formal input and, ideally, veto power over major changes.

Fourth, *transparent accounting of who benefits and how*. Before construction, the project's proponents should be required to lay out, in plain terms, the expected flows of benefit: to shareholders, to corporate customers, to state coffers, and to the host community. This is not to forbid asymmetry—some projects with wider benefits will always yield more gain to distant actors than to locals—but to make the asymmetry visible and contestable. Communities may

still choose to accept a project with unequal benefits, but they should not be asked to do so under illusions of parity.

Finally, reciprocity includes *the right to say no without penalty*. If rejecting an underground reactor means that a community is implicitly threatened with economic punishment—loss of unrelated state funding, withdrawal of other investments, or stigmatization as "anti-progress"—then consent is compromised. Ethical gating requires that the choice not to host such a facility be respected as a legitimate outcome, not treated as a failure.

For Parsons, these considerations are sharpened by history. The town has already served as a node in national projects that delivered mixed benefits: jobs and pride on one side, accidents and lingering contamination on the other. An underground reactor tuned to the needs of an AI-powered energy future may look, on paper, like a new opportunity. But unless safety, transparency, and reciprocity are treated as hard gates rather than decorative rhetoric, the pattern risks repeating: risk concentrated in a quiet place, benefits dispersed to those with more power, and consent invoked without being fully earned.

10. Parsons as a Mirror for National Energy Choices

It would be easy to treat Parsons as a curiosity: an oddly specific combination of former cluster-bomb plant, industrial park, and proposed mile-deep reactor in a small Kansas county. But Parsons is more than a local anomaly. It is a mirror in which national energy choices become visible at a scale that human beings can actually think about.

When a first-of-its-kind underground reactor is paired with a former weapons complex, under a federal program tied to a symbolic deadline and an emerging AI-compute boom, the composite picture reveals what the country is prioritizing—and what it is willing to overlook. It shows how quickly a particular technological trajectory can solidify into "the path forward," even when alternative energy strategies remain underdeveloped or politically neglected.

Parsons thus offers a vantage point from which to ask: What kind of energy system is the United States trying to build? What possibilities are being closed off by racing ahead with certain pilots? And what lessons should be drawn before similar complexes of advanced nuclear and data centers are replicated elsewhere?

10.1 What this single site reveals about national priorities

Looking closely at Parsons, several national priorities come into focus, not as abstract policy goals but as concrete pressures on land, institutions, and communities.

First, there is the priority of *rapid capacity expansion* over deliberative transformation. The Reactor Pilot Program's explicit target of achieving criticality by a fixed date, outside national laboratories, signals a willingness to subordinate slower forms of public reflection to the need for visible milestones. The idea is not only to test technologies but to demonstrate that the United States can still "move fast" in nuclear energy after decades of perceived stagnation. Parsons becomes proof of concept not just in engineering terms but in tempo.

Second, Parsons reveals an emerging priority of *serving compute as a strategic load*. The siting of an advanced reactor in an industrial park that actively courts data centers is not accidental. It reflects a belief that AI and digital infrastructure are core national assets whose power needs justify novel nuclear deployments. The demand of servers and training clusters is treated as a given, something to be met rather than interrogated. The question becomes how to supply them—cheaply, cleanly, and securely—not whether the trajectory of unbounded compute growth itself should be a subject of public debate.

Third, the site highlights a longstanding but rarely acknowledged priority: *using familiar sacrifice zones* rather than redistributing risk. Choosing a former ammunition plant in rural Kansas, already shaped by wartime production and contamination, for a new high-consequence experiment suggests that it is easier to build on existing risk landscapes than to negotiate with communities that have not yet been drafted into such roles. Parsons is legible to decision-makers as a place that "does this kind of work," even if many residents would not describe their home in those terms.

Fourth, the project underscores a priority of *technological optimism over precaution*. The public narrative emphasizes the promise of underground reactors to solve multiple problems at once: decarbonization, grid stability, data-center growth, even national prestige. The unknowns and possible downsides are acknowledged only in technical registers. National energy strategy, as reflected in Parsons, appears more comfortable betting on complex, high-leverage technologies than on more mundane strategies like efficiency, demand shaping, or distributed generation that lack the same rhetorical glamour.

None of these priorities are purely irrational. The climate crisis is real; infrastructure needs are pressing; geopolitical risks are nontrivial. But Parsons makes visible the particular way the United States is choosing to respond: by doubling down on large, tightly coupled technological systems, sited in familiar peripheries, with timelines set from above.

10.2 Alternatives foreclosed when pilot projects race ahead

By design, pilot projects open possibilities: they create new technical options and institutional pathways. But they also close others. Once time, money, and political capital are invested in a specific configuration—like deep borehole reactors serving industrial parks and compute

clusters—alternative approaches to energy policy and infrastructure become harder to pursue, even if they were never fully explored.

In Parsons, at least three kinds of alternatives are quietly foreclosed as the Gravity reactor proceeds.

First, there are *alternative local energy futures*. Before a site becomes an anchor for a specialized nuclear-compute complex, it might have been imagined as a hub for other forms of development: regional renewable integration, agricultural co-ops, conservation and recreation, or mixed-use light industry. Once a mile-deep reactor and associated covenants are in place, many of those paths become impractical or impossible. The land's future is effectively written into a narrow script: it hosts energy and data infrastructure, and everything else is secondary.

Second, there are *alternative national strategies for meeting new loads*. Committing to advanced nuclear pilots oriented toward data centers signals that the country intends to solve the compute–energy problem primarily on the supply side, with high-density, high-tech generation assets. This makes other strategies—aggressive efficiency standards for data centers, demand-response integration, or caps on total power allocation to speculative uses like certain forms of cryptocurrency mining—politically less salient. If the narrative is "we will build our way out of the problem underground," then the harder work of reshaping demand and governance can be deferred or ignored.

Third, there are *alternative institutional relationships* between host communities and national projects. Once a place accepts a high-profile pilot under federal auspices, it becomes harder to renegotiate its role. Saying "no" to future expansions or similar projects elsewhere may be portrayed as inconsistency or ingratitude. The precedent set is that when the nation needs a proving ground, certain communities will step forward and say "yes" under constrained conditions. The possibility of organizing a different model—for example, one in which communities co-design projects, share governance, or insist on stronger reciprocity—shrinks as patterns harden.

The speed of pilot deployment exacerbates these foreclosures. When timelines are compressed, the space for exploring alternative futures shrinks as well. Energy infrastructure that might have been debated in the context of long-range regional planning becomes a fait accompli in a few years. The pilot becomes the path.

This is not an argument against experimentation. It is an argument for recognizing that pilots are not neutral tests; they are path-setting devices. In Parsons, the decision to drill a reactor borehole is also a decision not to fully investigate other ways the site and the region might contribute to an energy transition, or other ways new loads might be governed.

10.3 Lessons for future siting of advanced nuclear and data-center complexes

If Parsons is a mirror, the question is what those designing future projects should see in it—and what they should resolve to do differently elsewhere, regardless of whether the Gravity pilot is ultimately deemed a "success." Several lessons emerge.

First, *cumulative history matters*. Siting decisions should begin with an honest accounting of what a place has already borne: prior military uses, industrial accidents, contamination, and broken promises. A site that has functioned as a de facto sacrifice zone should trigger stricter, not looser, ethical scrutiny. At minimum, this means explicit cumulative-impact assessments and a presumption against stacking yet another high-consequence technology on top of old ones without compelling justification.

Second, *pilot projects must not outrun consent*. The desire to move fast should not be allowed to truncate genuine community deliberation. Timelines set in Washington or corporate headquarters should be adjustable in response to local questions, not vice versa. This implies designing pilot programs with built-in pauses—points at which continuation requires affirmative local re-authorization, not just the absence of organized opposition.

Third, *bundling generation and compute should trigger higher bars, not lower ones*. When advanced nuclear facilities are sited specifically to serve data centers and AI clusters, the stakes change. The social value of each additional unit of compute is not self-evident, and the environmental and infrastructural impacts can be large. Siting guidelines should therefore treat nuclear-compute complexes as a distinct category that demands more robust justification, stronger reciprocity mechanisms, and clearer public benefits than generic "economic development."

Fourth, *risk governance should be designed for the full life of the system, not just early optimism*. For underground reactors, this means clear, enforceable provisions on long-term monitoring, decommissioning, and post-closure stewardship that survive corporate mergers and political cycles. For data centers, it means planning for the eventual obsolescence of hardware and software, not assuming continuous growth. Together, it means that the people living above and around these complexes are not left with stranded risks once the boom phase has passed.

Fifth, *host communities should have standing in national energy debates, not just in local permit hearings*. The experience and perspectives of places like Parsons should inform how future advanced nuclear and data-center policies are written: eligibility criteria, funding structures, and ethical standards. This can be formalized through national advisory councils that include representatives from host regions, or through stronger mandates for community-driven research and oversight.

Finally, there is a more basic lesson: *energy choices are value choices, not just technical optimizations*. Whether the country decides to prioritize underground reactors for AI, distributed renewables, demand reductions, or some combination, each path expresses a view about what kind of risks we are willing to take, whose landscapes we are willing to reshape, and what we consider progress. Parsons makes that visible because the contrast between its past and proposed future is so stark.

If those designing the next generation of nuclear and data-center complexes are willing to learn from that visibility—rather than treating Parsons as a one-off curiosity—the country's energy future could be shaped with more honesty, reciprocity, and care. If not, the pattern will repeat: new infrastructures descending into old sacrifice zones, wrapped in narratives of abundance and inevitability, while the deeper questions about how and where we choose to live with risk remain unasked.

11. Conclusion: What We Owe the Places We Load with Risk

Parsons is a small town in southeast Kansas, but the sequence of decisions that have shaped its outskirts tell a large story. Once drafted into service for war production, the land east of town is now being drafted into an energy–compute future. The labels have changed—from Kansas Army Ammunition Plant to Great Plains Industrial Park, from cluster munitions to "Gravity" reactors—but the underlying pattern is recognizably continuous: when the nation needs a place for high-consequence experiments, it turns to quiet ground that is already carrying scars.

To conclude is not to resolve the debate over whether an underground reactor in Parsons is categorically right or wrong. It is, rather, to state plainly what this case reveals and what it demands. Any community asked to host a first-of-its-kind reactor on land that once produced cluster bombs deserves more than assurances and ribbon cuttings. It deserves a reckoning with history, a standard of consent that is more substantial than process compliance, and a share of the power—literal and figurative—that these infrastructures create.

The questions Parsons raises will not stay in Parsons. They reach outward, toward the ethics of advanced nuclear siting, the governance of AI-driven energy demand, and the basic responsibilities we bear to the places that carry disproportionate risk on behalf of others.

11.1 Recapitulating the Parsons pattern from munitions to reactors

Seen from a distance, the Parsons story falls into three movements. The first is the construction and operation of the Kansas Army Ammunition Plant during World War II and subsequent conflicts. The plant turned rural farmland into a militarized landscape, producing artillery rounds

and cluster munitions that tied local jobs to distant battlefields and left behind contamination, accidents, and moral ambiguity.

The second movement is the rebranding of that landscape as the Great Plains Industrial Park. Base closure and partial cleanup paved the way for a new name and a new mission: to attract tenants, generate tax base, and reimagine the land as a site of opportunity rather than a relic of war. Economic development narratives emphasized acreage, infrastructure, and logistics, while the full moral and environmental weight of the plant's history faded into the background.

The third movement is the proposed installation of Deep Fission's mile-deep Gravity reactor under that same ground, accelerated by a national pilot program and pitched as a step toward "energy abundance" in an AI-hungry world. The underground reactor promises firm, low-carbon power for industrial loads and data centers, with minimal surface footprint and a story of geological shielding that treats the Earth itself as containment.

Across these movements, several continuities stand out. Risk is repeatedly concentrated in the same place, while benefits are widely dispersed. National priorities—first wartime production, then post-industrial redevelopment, now compute-driven energy expansion—set the agenda, and local communities are invited to adapt. Each new project is treated administratively as a fresh decision, yet in practice it builds on the physical, institutional, and psychological legacies of what came before.

Recapitulating the pattern is not an exercise in fatalism, as if Parsons were doomed to host whatever high-consequence technology the future demands. It is a way of insisting that the reactor proposal cannot be understood as a clean break. A community whose land has already been loaded with the risks of cluster munitions and their aftermath has a particular standing when asked to host a deep borehole reactor. To ignore that standing is to pretend that history does not matter.

11.2 Toward a more honest standard of consent and remembrance

If history does matter, then both consent and remembrance must be redefined. In the prevailing model, consent is satisfied when regulatory hearings are held, environmental impact statements are filed, and local officials sign letters of support. Remembrance is satisfied when a plaque or a brief historical note acknowledges prior uses of the site. These are not meaningless practices, but they are not enough.

A more honest standard of consent begins by refusing to treat information asymmetry as acceptable. Residents should not have to choose between trusting experts on faith or attempting to become amateur nuclear engineers in their spare time. Instead, project proponents and public agencies must create conditions in which the community can genuinely understand the proposal's stakes: through plain-language materials, independent technical

review, and institutions—churches, schools, professional associations—that are willing to host sustained, open-ended discussion rather than one-off presentations.

Such consent also requires that "no" be a live option. If local opposition is only tolerated when it is symbolic, and meaningful resistance is quietly countered by economic pressure or political marginalization, then the word "consent" loses its moral force. A community that knows it cannot afford to reject a project because nothing else is on offer is not truly consenting; it is choosing among constrained harms. Ethical gating functions, as argued earlier, are one way to acknowledge this: by specifying conditions under which a project is not merely unwise but impermissible, regardless of economic incentives.

Remembrance, in this context, goes beyond nostalgia or commemorative events. It entails integrating the memory of past harms and contested decisions into present deliberation. In Parsons, that means the 1989 explosion, the controversies over cluster munitions, and the long tail of contamination are not politely set aside as "old news" when evaluating the reactor. Instead, they inform sharper questions about institutional reliability, environmental monitoring, and the credibility of safety assurances.

A community that practices such remembrance is less likely to be disarmed by optimistic narratives of innovation. It is more likely to ask: Who is promising what, based on which track record? How did previous guarantees about safety and cleanup play out? What mechanisms are in place this time to prevent the repetition of familiar patterns? In this sense, remembrance is a form of civic self-defense.

11.3 Open questions for ethics, policy, and local action

Even with clearer patterns and stronger standards, Parsons leaves many questions open—questions that cannot be answered solely by technical analysis or by local stakeholders acting alone. They fall roughly into three domains.

For ethics, the central unresolved issue is how to weigh the risks borne by specific communities against benefits spread across much larger populations. Advanced nuclear sited in rural areas to power national compute infrastructure intensifies this asymmetry. Under what conditions is such an arrangement justifiable, if at all? How should intergenerational duties be factored in when technologies and waste streams last far longer than corporate lifetimes and political cycles? And how do we treat the moral status of places that have already functioned as sacrifice zones: as "experienced" sites uniquely suited to host more risk, or as communities that have, in fact, already given enough?

For policy, Parsons raises questions about how pilot programs and siting frameworks are designed. Should federal initiatives like the Reactor Pilot Program include explicit requirements for cumulative-impact assessment and community benefit agreements, rather than assuming

that individual projects will handle these ad hoc? Should there be national criteria limiting the concentration of high-consequence facilities in any one region or type of community? How can energy policy integrate demand-side governance—especially around data centers and AI—so that supply-side solutions like underground reactors are not the only option on the table?

For local action, the questions are more immediate. How can residents of towns like Parsons strengthen their own moral and civic infrastructure, so that when new projects arrive they do not enter a vacuum? What roles will churches, schools, and local professionals choose to play: passive recipients of information, or active conveners of deliberation? Can regional coalitions among host communities—those near ammunition plants, refineries, nuclear facilities, and data centers—develop shared principles and mutual support, so that each town is not isolated in negotiating with much larger institutions?

Parsons does not supply definitive answers to these questions. What it offers is a sharpened view of what is at stake. The decision to place a reactor a mile under Kansas soil is not simply about one company and one pilot; it is about the evolving terms on which a technologically ambitious society asks certain places to carry its risks.

What we owe those places is, at minimum, clarity, honesty, and reciprocity. Clarity about the full pattern into which a new project fits. Honesty about uncertainties, failure modes, and past mistakes. Reciprocity that goes beyond jobs to include meaningful voice, enduring benefits, and the power to refuse.

Whether or not the Parsons reactor is ultimately built, these are the standards by which similar decisions elsewhere will be judged—if not immediately, then in the eyes of those who will live with the consequences long after today's press releases and pilot programs are forgotten.

12. References

1. Strader S, Williams P. 2025. Underground nuclear reactor construction to begin in Parsons. KOAM News, 4 December 2025. Local television news report on Deep Fission's pilot project in Great Plains Industrial Park, Parsons, Kansas. Facebook

2. Anderson P. 2025. Groundbreaking set for next week on underground nuclear reactor in Parsons. WIBW, 4 December 2025. Regional news coverage of the Deep Fission borehole reactor announcement and ceremony date. https://www.wibw.com

3. Kansas News Service / Lawrence Times. 2025. Kansas will get the world's first mile-deep nuclear reactor. Lawrence Times, December 2025. Explainer on the Parsons project, its depth, and political backing. The Lawrence Times

4. Deep Fission Inc. 2025. Nuclear Company Deep Fission Announces Site for Department of Energy Pilot at Great Plains Industrial Park in Kansas. Company press release announcing selection of Parsons, Kansas, for the Gravity pilot reactor and outlining project goals. Deep Fission, Inc+2Deep Fission, Inc+2

5. Deep Fission Inc. 2025. Deep Fission Unveils the Name of its Deep Borehole Reactor: Gravity. Company media release describing the Gravity reactor concept, one-mile-deep siting and pressurized water design. Deep Fission, Inc+1

6. Spencer T, Singh S, et al. 2025. Energy and AI. International Energy Agency (IEA) report. Sections on data centre electricity demand and AI-driven growth in global and U.S. power use. IEA+2IEA+2

7. Pew Research Center. 2025. What we know about energy use at U.S. data centers amid the AI boom. Short read summarizing IEA estimates for U.S. data centre electricity consumption and projected growth to 2030. Pew Research Center

8. Carbon Brief. 2025. AI: Five charts that put data-centre energy use and emissions into context. Analysis of scenarios in which global data centre electricity use more than doubles by 2030, driven largely by AI. Carbon Brief

9. S&P Global Commodity Insights. 2025. Global data center power demand to double by 2030 on AI surge. News and analysis on projected TWh demand and regional trends for data centre power. S&P Global

10. World Nuclear News. 2025. Kansas site selected for underground reactor demo. Brief on Deep Fission's choice of Great Plains Industrial Park and plans for a full-scale plant following the pilot. World Nuclear News

11. International Energy Agency. 2025. Energy and AI – Executive Summary. Overview of AI's contribution to rapid growth in global data centre electricity consumption and regional distribution of that demand. IEA

12. IEEE Spectrum. 2025. Deep Fission Plans to Sink Nuclear Reactors Deep Underground. Feature article describing the Gravity reactor design, borehole depth, and claimed safety and cost advantages. IEEE Spectrum+1

13. U.S. Department of Energy (DOE). 2025. U.S. Department of Energy Reactor Pilot Program. Official program page outlining goals, authority under the Atomic Energy Act, and the target of three advanced reactors achieving criticality by July 4, 2026. The Department of Energy's Energy.gov

14. Nuclear Innovation Alliance. 2025. A Review of Recent DOE Updates to Its Reactor Authorization Process. Analysis of the Reactor Pilot Program and its relationship to executive directives and advanced reactor deployment. Nuclear Innovation Alliance

15. Utility Dive. 2025. DOE's reactor pilot: A turning point for US nuclear energy? Article discussing how the pilot could reshape advanced nuclear deployment and associated risks. Utility Dive

16. Reuters. 2025. US selects 11 projects for program to fast-track small nuclear test reactors. News report on DOE's selection of vendors—including Deep Fission—for the Reactor Pilot Program, with emphasis on AI and data-centre-driven power demand. Reuters

17. Kansas Army Ammunition Plant. Online encyclopedia entry. Summary of the plant's establishment in 1942, roles in World War II, Korea and Vietnam, and deactivation in 2009; includes mention of the 1989 BLU-97 explosion. Wikipedia

18. United Press International (UPI). 1989. Army: damaged fuse probably triggered fatal blast. UPI archive article on the July 26, 1989 explosion of a BLU-97 A/B cluster bomb at the Kansas Army Ammunition Plant that killed two workers. Upi

19. U.S. Army / URS Group Inc. 2005–2008. Environmental condition and investigation reports for the Kansas Army Ammunition Plant. Includes RCRA Facility Investigation reports and site condition summaries used in subsequent contamination assessments. AEC+1

20. U.S. Environmental Protection Agency (EPA) Region 7. 2003–2005. Environmental Indicator Determinations for Kansas Army Ammunition Plant (CA725 and CA750). Documentation of RCRA corrective action status and control of human exposure and groundwater migration. US EPA+1

21. U.S. Department of Defense, Office of Inspector General. 2013. Cost Increases and Delays Occurred During Closure and Reuse of Selected BRAC 2005 Realignment Sites. Includes discussion of Kansas Army Ammunition Plant closure, transfer and redevelopment arrangements with Great Plains Development Authority. U.S. Department of War

22. Great Plains Development Authority / Great Plains Industrial Park. 2023–2025. Industrial Park overview, data centre marketing, Kansas Proving Grounds materials and carbon-neutral park claims. Official web materials describing site acreage, infrastructure and target industries. Great Plains Industrial Park+4Great Plains Industrial Park+4Great Plains Industrial Park+4

23. U.S. Economic Development Administration (EDA). 2017. Kansas – FY 2017 Annual Report. Section on infrastructure grants to Great Plains Development Authority for water system improvements at Great Plains Industrial Park following ammunition plant transfer. U.S. Economic Development Administration

24. Union Pacific Railroad. 2020. Ammunition for Growth: How a Former Military Facility Became an Economic Engine. Corporate case study on redevelopment of the former Kansas Army Ammunition Plant into Great Plains Industrial Park and associated rail-served logistics benefits. Up

25. United Nations Treaty Collection. 2008. Convention on Cluster Munitions. Official treaty record noting adoption in Dublin on 30 May 2008, entry into force in 2010, and number of state parties and signatories. United Nations Treaty Collection+1

26. International Committee of the Red Cross (ICRC). 2008. Convention on Cluster Munitions. Publication containing the full treaty text and explanatory material on obligations for clearance, victim assistance and stockpile destruction. Article36+3ICRC+3The Convention on Cluster Munitions+3

27. Cluster Munition Coalition. 2013. Convention on Cluster Munitions – Background and Implementation. Civil-society overview of the convention's humanitarian rationale, history of negotiations and implementation challenges. Reaching Critical Will

28. World Economic Forum. 2025. How data centres can avoid doubling their energy use by 2030. Commentary on efficiency measures and policy options to limit data centre energy demand growth, citing McKinsey projections for U.S. electricity share. World Economic Forum

29. SP Global / Energy Intelligence. 2025. Global data center power demand to double by 2030 on AI surge – IEA. News analysis of projections for global data centre electricity demand and regional breakdowns. S&P Global

30. Kansas State University / Economic Development Administration. 2011. New network to help companies in rural Kansas compete in the global marketplace. News release referencing collaboration with Great Plains Development Authority on redevelopment of the ammunition plant site.

The author has published over 4,600 AI-assisted papers at: https://www.researchgate.net/profile/Douglas-Youvan/research . Google Scholar has indexed these preprints, and if you want a particular reference, the AI mode of a Google search (Gemini) has efficiently catalogued these preprints.